

## Scientific Note

### DISCOVERY OF *BRUCHIDIUS VILLOSUS* F. (COLEOPTERA: BRUCHIDIDAE) ON SCOTCH BROOM IN CANADA

Scotch broom (*Cytisus scoparius* (L.) Link [Fabaceae]) is an invasive leguminous shrub native to continental Europe (Waloff, N. 1966. *J. Appl. Ecol.* 3: 293–311). Scotch broom has now been disseminated to temperate regions of the world with movements of people. In North America it was introduced as a garden or ornamental hedge species and has since spread far beyond the bounds of cultivation in all locations (Zielke, K., J. O. Boateng, N. Caldicott & H. Williams. 1992. *Broom and gorse in British Columbia: a forestry perspective problem analysis.* Ministry of Forests, Victoria, British Columbia) and is now distributed along both the Atlantic and Pacific Coasts. Scotch broom had become naturalized in British Columbia and in initial surveys was found on southern Vancouver Island, the Lower Mainland, and the Gulf Islands as far north as Cortes, Hernando, Savary and Texada Islands (Taylor, T. M. C. 1974. *The pea family of British Columbia.* British Columbia Provincial Museum Handbook No. 32, Victoria, British Columbia). More recent spread has been reported to the northern limit of Vancouver Island and into the Queen Charlotte Islands (Zielke, K., J. O. Boateng, N. Caldicott & H. Williams. 1992. *Broom and gorse in British Columbia: a forestry perspective problem analysis.* Ministry of Forests, Victoria, British Columbia). Scotch broom is also occurs on the Sunshine Coast to Powell River, through the Fraser and Chilliwack Valleys, into Hope, in the west Kootenay region in the British Columbia interior, and between Nelson and Castlegar (Zielke, K., J. O. Boateng, N. Caldicott & H. Williams. 1992. *Broom and gorse in British Columbia: a forestry perspective problem analysis.* Ministry of Forests, Victoria, British Columbia). Several European broom specialist insects are known from broom in western North America; *Aceria genistae* Nalepa (Acari: Eriphyidae), *Agonopterix nervosa* Haworth (Lepidoptera: Oecophoridae), *Arytainilla spartiophila* Förster (Hemiptera: Psyllidae), (*Ctenocallis setosa* Kaltenbach (Homoptera: Aphididae), *Gargara genistae* F. (Hemiptera: Membracidae), *Dictyonota fuliginosa* (Costa) (Hemiptera: Tingidae), *Leucoptera spartefolliella* (Hübner) (Lepidoptera: Lyonetiidae), and three species of mirids (Chan, K. L. & C. E. Turner. 1998. *Pan-Pacific Entomol.*, 74(1): 55–57; Andres, L. A. & E. M. Coombs. 1995. *Scotch broom.* In Nechols, J. R.; L. A. Andres; J. W. Beardsly; R. D. Goeden; and C. G. Jackson (eds.). *Biological control in the western United States: accomplishments and benefits of regional research project W-84.* Berkeley, California, United States of America, University of California, Division of Agriculture and Natural Resources, Pub. No. 3361, pp. 303–305; Pfeiffer, D. G. 1986. *J. Entomol. Sci.*, 21(3): 214–218; Waloff, N. 1966. *J. Appl. Ecol.*, 3: 293–311; Downes, W. 1957. *Entomol. Soc. B. C.*, 54: 11–13; Footit, R. G. & W. R. Richards. 1993. *The insects and arachnids of Canada. Part 22: The genera of aphids in Canada (Homoptera: Aphidoidea and Phylloxeroidea),* Agriculture Canada, Ottawa; Syrett, P., S. V. Fowler, E. M. Coombs, J. R. Hosking, G. P. Markin, Q. Paynter & A. W. Sheppard. 1999.

Biocontrol News Inf., 20: 17N–34N). No biological control agents have been intentionally introduced as part of a biological control program for Scotch broom in Canada. We report here the discovery of another accidentally introduced insect specialist *Bruchidius villosus* F. (Coleoptera: Bruchidae) on Scotch broom in the vicinity of Victoria, British Columbia.

The Scotch broom seed-feeding beetles were discovered in a seed collection conducted in mid-July 2000. Pods were collected from approximately 50 plants over a one-hectare area on a power line right-of-way that intersects Munn Road, Victoria (48°31'00" N, 123°26'00" W, elevation 81 m). The site is within the coastal Douglas-fir biogeoclimatic zone on a rock outcrop dominated by *C. scoparius*, *Quercus garryana*, *Holodiscus discolor*, and grass species. After collection, mature seeds were removed from pods and placed in vials for storage. In early August 2000, sixty-six *B. villosus* had emerged from the seeds through small holes. Examination of the remaining seeds revealed that the seeds infested with beetles had darkened noticeably since collection. Within 10 days the 416 beetles had emerged (51 failed to emerge) from a total of 1179 seeds (approximately 100 pods).

The beetles were subsequently identified by J. M. Kingsolver of the Florida State Collections of Arthropods as *Bruchidius villosus* F. (Coleoptera: Bruchidae), described from Scotch broom (*Sarothamnus scoparius* Koch. [= *Cytisus scoparius* (L.) Link]) by B. J. Southgate (Southgate, B. J. 1963. Ann. Entomol. Soc. Am., 56: 795–797). It is unknown how or when these bruchids arrived in British Columbia. This is the first record of *B. villosus* in British Columbia.

In Europe, *Bruchidius villosus* is restricted to Scotch broom and the adults only oviposit in the presence of a broom pod (Parnell, J. R. 1966. J. Anim. Ecol. 35: 157–188). Its native range includes the U.K., France, Portugal, Spain, Austria, Denmark, Germany, Hungary, Italy, and Switzerland (Frick, K. E. 1962 Unpublished file report, USDA—Agricultural Research Service; Syrett, P. & K. E. Emberson. 1997. Biocontrol Sci. Technol., 7(3): 309–326). *B. villosus* has been intentionally introduced in Australia and New Zealand where broom has also become naturalized. Small numbers of *B. villosus* were released in the United States in 1998 in the foothills of the Cascades and on the Oregon coast. To date there have been no recoveries of *B. villosus* from the coastal 1998 release site, however, given the low number of adults (130) released, it is not surprising and is not considered a failed release. *B. villosus* was released at 18 sites in Oregon and Washington State in 1999. The beetle was recovered at two 1999 release sites inspected in 2000. There are now more than 30 releases on Scotch broom and one each on French and Portuguese broom (D. Isaacson, personal communication). In 2001, an informal survey was conducted to determine the distribution of *B. villosus* on Scotch broom in British Columbia. *B. villosus* was found at 31 of 32 sites on Vancouver Island from 48°25' N to 50°01' N and at nine of 11 sites on the mainland from 49°02' N to 49°54' N. Seed damaged varied from 1% to 87% depending upon site. Based on my observations that *B. villosus* is common and widespread on Scotch broom in British Columbia, it seems unlikely that bruchids released in the Pacific Northwest of the United States are the source of the Canadian populations. *B. villosus* was first recorded on Scotch broom in Massachusetts in 1918 after an accidental introduction (Bottimer, L. J. 1968. Can. Ent., 100: 139–145). One could postulate that *B. villosus* has spread from Mas-

sachusetts site to western Canada, utilizing other legumes as hosts in the absence of Scotch broom, however, given the host specificity of *B. villosus*, this is unlikely (Parnell, J. R. 1966. *J. Anim. Ecol.*, 35: 157–188). Another hypothesis is that *B. villosus* was independently introduced into British Columbia after 1963 when Waloff (Waloff, N. 1966. *J. Appl. Ecol.*, 3: 293–311) reported that there were no insects living inside the broom pods.

Additional collections of Scotch broom pods will be made next season to determine the range and infestation levels of this species in British Columbia as well as its potential for control of the spread of Scotch broom.

*Records.*—BRITISH COLUMBIA, VICTORIA: Munn Road, 18 July 2000, L. R. E. Hooper, *Cytisus scoparius*, seeds.

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